

# इंटरनेट

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IS 5839 (2000): Food Hygiene - Code of Practice for Manufacture, Storage and Sale of Ice Cream [FAD 15: Food Hygiene, Safety Management and Other Systems]



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खाद्य स्वच्छता — निर्माण, भण्डारण और आइस क्रीम  
बेचने के लिए रीति संहिता  
( पहला पुनरीक्षण )

*Indian Standard*  
FOOD HYGIENE — CODE OF PRACTICE  
FOR MANUFACTURE, STORAGE AND SALE  
OF ICE CREAM  
( *First Revision* )

ICS 67.020; 67.100.40

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## FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Food Hygiene Sectional Committee had been approved by the Food and Agriculture Division Council.

Ice cream is one of the most popular foods widely consumed by people of all classes and age groups, including high risks people, without further processing. During manufacture, packaging and distribution of ice cream, it is open to microbial contamination from a variety of sources including the raw materials used as ingredients, processing, freezing and filling equipment, containers and packaging materials and also persons handling ice cream. Many species of micro-organisms, including pathogenic and toxin producing types, may gain entry into ice cream and some of them are also able to grow in the product when exposed to atmospheric temperatures, thus rendering the product potentially harmful for human consumption. It is, therefore, imperative that (a) high standards of sanitation should be maintained at all stages from production to distribution of ice cream; (b) the ice cream mix before freezing should be subjected to efficient pasteurization treatment to destroy all pathogens; (c) the ingredients, fruits, nuts, etc, which are added to the ice cream mix after pasteurization should be of high microbiological quality and processed properly so as to reduce the microbiological load in the final ice cream; (d) adequate precautions should be taken to prevent recontamination of the product during its freezing, packaging, storage and distribution; and (e) all persons on the manufacturing line at every stage including packaging and storage as also in its sales and distribution should be those who have adequate awareness and practice a high standard of personal hygiene.

Consumers do not have the available knowledge or means of ensuring the safety and quality of the ice cream they purchase. For this, they rely on the hygienic standards of premises where ice cream is manufactured. This Indian Standard code was originally published in 1970, to provide the needed guidance to the industry for ensuring hygienic practices in manufacture, storage and sale of the ice creams. This revision has been taken up to update the requirements of the text and also to make it compatible with IS 2491 : 1998 'Food hygiene — General principles — Code of practice (*second revision*)'.

This code is an adjunct to IS 2491 : 1998 and covers requirements specific to ice cream industry.

This code is subject to the provisions in the *Factories Act*, 1948, and the *Prevention of Food Adulteration Act*, 1954, and the Rules framed thereunder as amended from time to time.

*Indian Standard*

**FOOD HYGIENE — CODE OF PRACTICE  
FOR MANUFACTURE, STORAGE AND SALE  
OF ICE CREAM**  
*( First Revision )*

**1 SCOPE**

This code specifies the hygienic conditions and hygienic practices required to be adopted in the manufacture, packaging, storage, distribution and sale of different varieties of ice creams. This code is by and large also applicable to milk ices or milk lollies, ice-candies and similar products.

**2 REFERENCES**

The following Indian Standards contain provisions which through reference in this text, constitute provision of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

<i>IS No.</i>	<i>Title</i>
2491 : 1998	Food hygiene — General principles — Code of practice ( <i>second revision</i> )
3382 : 1965	Stainless steel milk pipes and fittings

**3 DEFINITION**

**3.0** For the purpose of the standard, the definitions given below shall apply in addition to those given in IS 2491.

**3.1 Ice Cream**

Ice cream means the frozen product obtained from cow or buffalo milk or a combination thereof or from cream, and/or other milk products, with or without addition of cane sugar, (dextrose, liquid glucose and dried liquid glucose), eggs, fruits, fruit juices, preserved fruits, nuts, chocolates, edible flavours and permitted food colours. It may contain permitted stabilizers and emulsifiers in stipulated limits. This mixture should be suitably heated before freezing. Air is incorporated into the mixture during freezing. The product is packed in different food grade packages.

**3.2 Milk Ices or Milk Lollies**

Milk ices or milk lollies means the frozen product obtained from milk, skimmed milk or milk product with or without addition of cane sugar (dextrose, liquid

glucose and dried liquid glucose) eggs, fruits, juices, nuts, chocolates, edible flavours and permitted food colours. It may contain permitted stabilizers in stipulated limits. The mixture shall be suitably heat treated before freezing. The product is packed in different food grade packages.

**3.3 Ice-Candies**

Ice-candy means the frozen ice produced which may contain fruit, fruit juices, cocoa, nuts, citric acid, permitted flavours and colours. It may also contain permitted stabilizers and/or emulsifiers in stipulated limits. It should not contain any artificial sweetener. The product is packed in food grade packages.

**4 ESTABLISHMENT : DESIGN AND FACILITIES**

**4.1** Plant construction and facilities should be in accordance with 5 of IS 2491. This will include location and premises and rooms, including design and layout and internal structures and fittings and facilities like water supply, drainage and waste disposal, cleaning, personal hygiene facilities and toilets, ventilation, lighting and storage.

**4.2 Equipment**

**4.2.1** The premises where ice cream is manufactured should use standard types of equipment for preparing the mix, pasteurization of mix, homogenization, cooling, ageing, freezing, hardening, packaging and storage of ice cream. Refrigerated rooms should be used for the hardening and storage of ice cream.

**4.2.2** The equipment should be constructed and installed in such a manner as to facilitate efficient cleaning and sterilization and easy dismantling and assembling. The material used for the equipment should be resistant to corrosion, or protected against corrosion.

**4.2.3** All the materials used for construction of those surfaces of equipment which come into contact with the ice cream should be non-toxic. The use of galvanized sheets should be minimum. All gasketing and packing materials should be non-porous.

**4.2.4** Pasteurization equipment should be properly designed, installed, maintained and operated to ensure

that every particle of the ice cream mix is heated to at least the minimum specified temperature for at least the specified time. The design of pasteurization equipment should comply with general equipment hygiene requirements. The pasteurization equipment should have accurate temperature indicating instruments preferably with a recording device. A record should be maintained and adequate agitating arrangements should be provided in the case of batch pasteurizers. The continuous pasteurizers should also be equipped with automatic flow diversion valves.

**4.2.5** Surface coolers should be provided with metal shields for protection from air contamination. All vats and tanks should have proper covers.

**4.2.6** All piping used for conducting ingredients, mix or ice cream should be sanitary milk piping of a type which is possible to dismantle easily for cleaning and sterilization and should have smooth uncorroded surfaces (*see* IS 3382).

#### **4.3 Containers and Utensils**

**4.3.1** All multi-service containers and utensils used for handling ingredients, mix or ice cream should be constructed with corrosion resistant material, should have no dents or open seams, should be cleanable easily and should be in a good state of repair.

#### **4.4 Cleaning**

After the day's production, all machines should be cleaned with suitable detergent solution or through CIP system and sanitized.

### **5 CONTROL OF OPERATION**

#### **5.1 Ice Cream — Ingredients**

##### **5.1.1 Milk and Milk Products**

**5.1.1.1** Milk and milk products of good hygienic quality should be used. Milk should be fresh, sweet, clean and free from foreign matter. Milk should also be free from neutralizers, preservatives and adulterants. Cream should be fresh and sweet, free from any off-flavours or other defects and of low bacterial count. Sour cream should not be used. Condensed, evaporated and dry milk products and butter should be as fresh as possible and free from rancidity, and off-flavours.

**5.1.1.2** All milk and fluid milk products should be received in clean and sanitized containers, cooled immediately to refrigerated temperature to around 4°C and maintained at that temperature till they are required for use in preparing the mix. The containers should be kept closed, preferably in separate room or isolated place, to prevent contamination and absorption of gases and odours. Dry milk products should be

stored in a place of low humidity and the containers kept tightly covered.

##### **5.1.2 Sweetening Agents**

Sugar and other permitted sweetening agents should be clean and properly packed and stored in a clean and dry place to prevent microbiological contamination. Sugar, if stored in gunny bags should not be placed on floors.

##### **5.1.3 Fruits and Fruit Preparations**

**5.1.3.1** Various fruits and fruit preparations, such as juices, sterilized and canned fruits, cold packed and preserved fruits, and frozen or canned fruit juices are added to the mix at the time of or after freezing. Fresh fruits, free from any physical damage or signs of spoilage, should be obtained and stored at low temperature till required for use. Fruits should be washed thoroughly in potassium permanganate solution or chlorine solution. They should be peeled with clean, rust free, preferably stainless steel knives and cut or mashed in clean and hygienic conditions. The juice should be extracted in good, clean and sanitized vessels. Frozen fruits and canned materials after opening the pack should be preserved in the cold store in their original containers and required quantities withdrawn periodically using sanitized dippers or other utensils.

**5.1.3.2** Except in the case of canned and heat-sterilized materials all other fruits and fruit preparations should be subjected to suitable bactericidal treatments before adding to the mix. Drastic heating or treatment with strong smelling disinfectants should be avoided as they will affect the flavour.

##### **5.1.4 Nuts**

**5.1.4.1** Various nuts, free from infestation, such as walnuts, almonds, pistachio, cashew nuts, peanuts, etc, may be added to ice cream. Nuts in the ice cream can be a potential source of contamination. It is, therefore, imperative that care is taken during processing of nuts before their addition in ice cream in order to avoid contamination.

**5.1.4.2** The cleaned nuts should be stored in clean containers preferably in cold stores and protected from contamination during storage or handling.

##### **5.1.5 Chocolates**

**5.1.5.1** Cocoa or liquor chocolate of good quality should be obtained and stored in a clean and dry place. If a chocolate mix is to be made separately, the cocoa or chocolate should be added to the mix prior to pasteurization and homogenization which will reduce the contamination from this source.

**5.1.5.2** If, however, the chocolate is required to be

added to a few batches of the mix prior to freezing, a syrup containing cocoa, sugar and water in suitable proportions should be prepared first and heated at 90 to 95°C for 15 to 20 minutes. It may then be cooled down and added to the mix prior to freezing. If sterilized chocolate syrups in sealed tins are available in the market they may be directly added to the mix. Opened tins containing the syrup should be properly covered and held in the cold store.

#### 5.1.6 *Flavouring Materials*

Various permitted flavouring agents are added to ice cream mix prior to freezing. Most commonly used flavouring agents are nature identical flavours which are prepared and maintained in the form of propylene glycol and used in small concentrations. They are not considered to be significant source of contamination. Only such flavouring agents as permitted by PFA Rules should be used. Aqueous flavour extracts may be pasteurized at 63°C for 30 minutes without any significant alteration to the flavour.

#### 5.1.7 *Colouring Materials*

Colour solutions are added to the mix after pasteurization. When dry colours are used they should be dissolved in hot water at 80°C and then stored at 4°C till used. All colouring materials should conform to the PFA Rules.

#### 5.1.8 *Air*

Air plays a major role in ice cream manufacture. Air is rather an ingredient of ice cream. Proper care should be taken of the area from where the air is drawn. It should be drawn from a clean environment without any off-smell and controlled humidity to ensure the safety and suitability of ice cream. It is desired that the air which is incorporated in ice cream should be passed through suitable sterile filters to ensure that no microbiological contamination takes place.

### 5.2 *Preparation of Ice Cream Mix*

The ice cream mix should be prepared in properly cleaned sterilized vat or any other container. All sanitary precautions should be taken to prevent extraneous contamination during the preparation of the mix.

All ingredients, except colours, flavouring agents, fruits, nuts, etc, should be incorporated in the mix prior to heat-treatment. Heating of mix to desired temperature should be quick and pasteurization completed in less than one hour so that the bacterial growth is restricted.

### 5.3 *Pasteurization of Ice Cream Mix*

The pasteurization process can either be carried out

as a batch operation with the ice cream mix heated and held in an enclosed tank, or as a continuous operation with the ice cream mix heated in a heat exchanger and then held in a holding tube for the required time.

Ice cream mix should be pasteurized effectively by heating to a temperature of not less than 68.3°C for at least 30 minutes or to a temperature of not less than 79.5°C for at least 25 seconds or 83°C for 15 seconds or any other heat-treatment including UHT which has been proved to be equally effective in ensuring destruction of all pathogens in ice cream mix, may also be followed.

### 5.4 *Cooling and Ageing of Mix*

The pasteurized mix should be cooled to a temperature of 4.5°C within one and a half hours of heat-treatment and held at that temperature until it is taken out for freezing. For checking any changes in temperature during ageing, the vat should be fitted with accurate temperature indicating instruments, preferably, with a recording device. A record of the temperature should be maintained.

### 5.5 *Freezing, Packing and Hardening of Ice Cream*

The freezing of ice cream mix, packaging, cutting, molding, dipping and hardening may be carried out according to the type of equipment available and the variety of product to be made. The equipment and containers should be properly cleaned and sanitized before use and all precautions taken to prevent contamination of product during the different operations. The containers should be adequately covered immediately after filling. Caps and covers should be handled in such manner as to prevent contamination of the contents of the packages. Particular attention is required to prevent contamination of the ice cream from the semi-frozen stage to the final packing stage.

### 5.6 *Packaging*

The packaging materials used for ice cream should be of food grade. The packaging material should be stored in a clean and sanitary manner. The package should be designed to:

- a) Protect the organoleptic and other quality characteristics of the product;
- b) Protect the product against microbiological and other contamination;
- c) Protect, as far as practicable, against dehydration, heat accumulation by radiation and where appropriate, leakage; and
- d) Not to impart any odour, taste, colour or other foreign taint, throughout the processing and



distribution of the product up to the time of final sale.

Retail packages should be preserved intact up to the time of final sale.

### **5.7 Overflow Spillage**

Product drip, or overflow or spilled mix or ice cream should be collected in clean receptacles and subjected to heat treatment if they are to be reused.

### **5.8 Storage of Ice Cream**

The ice cream, either in bulk or retail packages should be stored at a temperature not exceeding  $-18^{\circ}\text{C}$  at plant until its disposal.

## **6 ESTABLISHMENT — MAINTENANCE AND SANITATION**

**6.1** The maintenance and sanitation procedures of the establishment shall be in accordance with 7 of IS 2491. In addition, the following guidelines shall be followed.

### **6.2 Procedure for Cleaning and Sterilization of Equipments, Containers and Dispensing Utensils used for Manufacture and Handling of Ice Cream**

**6.2.1** During the manufacture of ice cream the mix passes through various types of equipment like mixing vat, flow lines, pasteurizer, homogenizer, cooler, ageing vat and freezer while the final product comes in contact with packaging machines, containers and dispensing, utensils. All of them may act as serious sources of contamination and unless they are thoroughly cleaned and sterilized before use it will not be possible to obtain ice cream of acceptable quality and to guarantee its safety for human consumption. Cleaning and sterilization are two distinct and separate operations to be carried out consecutively. Cleaning involves the physical removal of visible milk residues from the surface of the equipment by washing with the aid of special cleaning compounds or detergents and in this process a major portion of contamination is also eliminated. Sterilization of the cleaned surface, which is achieved by the application of steam, hot air, hot water or chemical sterilants, is intended to destroy the residual bacteria and render the surface practically sterilized. It is emphasized that sterilization treatment will not be effective unless the equipment has been thoroughly washed beforehand so as to remove all visible dirt from the surface.

## **7 ESTABLISHMENT — PERSONAL HYGIENE**

Personal hygiene which includes health status, personal cleanliness, personal behaviour and visitors shall be in accordance with 8 of IS 2491.

## **8 TRANSPORTATION AND DISTRIBUTION OF ICE CREAM**

**8.1** All vehicles used for the transportation of ice cream should be so constructed and operated as to protect their contents from exposure to sunlight, dust and from contamination. The vehicles should be kept clean and no substance capable of contaminating the ice cream should be transported in the vehicles in such a manner as to cause contamination of the product.

**8.2** Suitable arrangement should be made to keep the ice cream in bulk containers or in retail packings in a frozen condition at a temperature not exceeding  $-12^{\circ}\text{C}$  till they are distributed. All precautions should be taken to prevent contamination of the contents of the packages during distribution. Loading and unloading from vehicles and from stores should be as fast as practicable and the methods used should minimize product temperature rise.

## **9 ITINERANT VENDORS**

Ice cream plants or factories should engage only licensed vendors and hawkers for selling their products in the market or in public places. The vendors should be allowed to transport and sell only factory packed ice cream. A temperature not exceeding  $-5^{\circ}\text{C}$  should possible be maintained in push cart of vendors. Transporting loose ice cream and dispensing it in cups at the time of sale in open places provides scope for heavy contamination of the product and this practice should be discouraged.

## **10 STORAGE AND SALE OF ICE CREAM IN RESTAURANTS AND CATERING ESTABLISHMENTS**

**10.1** Restaurants, catering establishments, sweetmeat shops and other selling outlets, which store and sell ice cream in retail to customers should be fully licensed for the purpose and fulfill all the hygienic requirements prescribed by the appropriate authorities in respect of public catering places.

**10.2** The floor and drains of the premises and every bench, counter, stall or other place where ice cream is stored or exposed for sale should be washed and cleaned effectively everyday using odourless bactericidal solution. There should be sufficient amount of clean water and detergents for cleaning of utensils and arrangements for toilet and washing of hands and for disposal of waste and used cups and spoons.

**10.3** Suitable refrigeration facilities should be provided for storage of ice cream in frozen conditions. No ice cream that has melted due to rise in temperature should be served to the customers.

**10.4** As far as possible, ice cream should be sold in their original factory packing. If the ice cream is stored in bulk, and portions are removed for filling in cups to be served to the customers, all precautions should be taken to prevent contamination of the product from the environment.

**10.4.1** Special precautions should be taken with regard to cleanliness of equipment, premises and the methods used for serving freezer fresh ice cream.

**10.5** No person should touch ice cream with their hands during filling in cups or serving to the customers.

**10.6** Ice cream cups and spoons and other single service containers should be kept in a clean container. Single service containers once used should not be used again for filling ice cream. Glass cups and other multi-service containers should be cleaned and sanitized effectively before use.

**10.7** Ice cream scoops or other appliances used for disposing ice cream into cups should be kept immersed in bactericidal solution or periodically immersed in hot water maintained at a temperature of at least 80°C.

**10.8** All persons handling ice cream for sale to the customers should be healthy and free from any infectious disease. They should wear clean clothes and observe strict hygienic practices.

## **11 RETURNED ICE CREAM**

Ice cream returned in broken and open containers after distribution should be discarded. Any ice cream which has been melted or exposed to temperature above -5°C during distribution and is returned to the plant in unopened containers, should be subjected to repasteurization and then used for freezing.

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### Amendments Issued Since Publication

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